

merchant or invader could penetrate from the estuary into the valley of the Thames; and in its earlier days, before the great changes wrought by the embankment of the Romans, this was also the first point at which any rising ground for the site of such a town presented itself on either shore of the river. Nowhere has the hand of man moulded ground into shapes more strangely contrasted with its natural form than on the site of London. Even as late as the time of Cæsar the soil which a large part of it covers can have been little but a vast morass. Below Fulham the river stretched at high tide over the ground that lies on either side of its present channel from the rises of Kensington and Hyde Park to the opposite shores of Peckham and Camberwell. All Pimlico and Westminster to the north, to the south all Battersea and Lambeth, all Newington and Kennington, all Bermondsey and Rotherhithe, formed a vast lagoon, broken only by little rises which became the "eyes" and "hithes," the "islands" and "landing-rises," of later settlements. Yet lower down to the eastward the swamp widened as the Lea poured its waters into the Thames in an estuary of its own, an estuary which ran far to the north over as wide an expanse of marsh and fen, while at its mouth it stretched its tidal waters over the mud flats which have been turned by embankment into the Isle of Dogs. Near the point where the two rivers meet, a traveller who was mounting the Thames from the sea saw the first dry land to which his bark could steer. The spot was in fact the extremity of a low line of rising ground which was thrown out from the heights of Hampstead that border the river valley to the north, and which passed over the sites of our Hyde Park and Holborn to thrust itself on the east into the great morass. This eastern portion of it, however, was severed from the rest of the rise by the deep gorge of a stream that fell from the northern hills, the stream of the Fleet, whose waters, long since lost in London sewers, ran in earlier days between steep banks—banks that still leave their impress in the local levels, and in local names like Snow Hill—to the Thames at Blackfriars. The rise or 'dun' that stretched from this tidal channel of the Fleet to the spot now marked by the Tower, and which was destined to become the site of London, rose at its highest some fifty feet above the level of the tide, and was broken into two parts by a ravine through which ran the stream which has since been known as the Wallbrook. Such a position was admirably adapted for defence; it was indeed almost impregnable. Sheltered to east and south by the Lagoons of the Lea and the Thames, guarded to westward by the deep cleft of the Fleet, it saw stretching along its northern border the broad fen whose name has survived in our modern Moor-gate. Nor, as the first point at which merchants could land from the great river, was the spot less adapted for trade. But it was long before the trader found dwelling on its soil. Old as it is, London is far from being one of the oldest of British cities; till the coming of the Romans, indeed, the loneliness of its site seems to have been unbroken by any settlement whatever. The 'dun' was in fact the centre of a vast wilderness. Beyond the marshes to the east lay the forest track of southern Essex. Across the lagoon to the south rose the woodlands of Sydenham and Forest Hill, themselves but advance guards of the fastnesses of the Weald. To the north the heights of Highgate and Hampstead were crowned with forest-masses, through which the boar and the wild ox wandered without fear of man down to the days of the Plantagenets. Even the open country to the west was but a waste. It seems to have formed the border-land between two British tribes who dwelt in Hertford and in Essex, and its barren clays were given over to solitude by the usages of primeval war."

Much more that must be of interest to those familiar with modern London does Mr. Green tell us about the

early city and its progress, and the influence upon its history, of its site, and the nature of the surrounding country. But these extracts will give the reader a fair idea of the method pursued by Mr. Green in this most interesting volume. The work contains numerous maps showing the condition of the surface in the various regions of the country at the time that the Saxons, Jutes, and Angles were with ruthless vigour laying the foundation of modern England and modern English history. Mr. Green, of course, discusses many incidental questions of interest, among others the extent to which the Celtic element remained after the settlement of the invaders, and influenced their blood and their character. Mr. Green essentially adopts the views advocated by Mr. Freeman, though his Teutonism does not appear to us to be quite so extreme. He brings his history down to about the year 830, when it may be said that England was roughly shaped into those outlines, topographical and social, of which the present conditions are the lineal development.

### NOTES

AT a recent meeting of the Trustees of the Lewes Studentship in Physiology, which was founded by the late "George Eliot" in memory of her husband, Mr. George Henry Lewes, the vacancy occasioned by the appointment of Dr. Roy to the Brown Professorship of Pathology in the University of London was filled up, according to the terms of the Trust, by the election of Mr. L. C. Wooldridge, D.Sc. (Lond.). Dr. Wooldridge is a former student of Guy's Hospital, who has lately been working in Prof. Ludwig's laboratory at Leipzig. He has already made investigations of importance, one of which, on the part taken by the white corpuscles in the coagulation of the blood, has been read before the Royal Society. The studentship is for three years, and its conditions provide for the holder devoting himself during that time to physiological researches. Wisely administered, such endowments of research are invaluable, and it is to be wished that there were more of them. The first appointment of the Trustees led to the brilliant work of Prof. Roy, and we do not doubt that their present choice will be no less amply justified.

THE expedition to be fitted out at the expense of M. Bischoffsheim to observe the solar eclipse next May in Egypt, will include M. Perrotin, director of the Nice Observatory, who will attend specially to the search for intra-Mercurial planets, and M. Thollon, who will have charge of the spectroscopic work. They will be accompanied by M. Guérain, photographer to the Paris Observatory.

THE collection of fossil fishes in the British Museum has lately received an immense addition by the transference from Florence Court to the new museum at Cromwell Road of the very extensive and important collection of the Earl of Enniskillen, and when in the course of a few weeks it receives the collection of the late Sir P. G. Egerton, which the Trustees have also purchased, the museum will contain a probably unrivalled collection of fossil fish. The collections of the late Sir P. G. Egerton and of the Earl of Enniskillen were commenced in 1826, when they were fellow-students at Oxford.

THE first annual general meeting of the Sanitary Protection Association was held on Saturday in the rooms of the Society of Arts in the Adelphi. Prof. Huxley, having read the report, pointed out that the Society, though it had only been in existence for a short time, had worked successfully. The houses examined had not been the dwellings of poor people, and therefore liable to be found in an insanitary condition, but had been houses occupied by well-to-do people, and of these 6 per cent. were in an absolutely pestiferous condition, leaving it to be the merest chance that they

had not become hotbeds of disease. In addition to this, in two-thirds of the houses inspected there were defects in the drainage arrangements, such as must fill any careful person with alarm, especially where children or delicate persons were among the occupant's. Prof. Fleeming Jenkin, one of the consulting engineers of the Association, spoke of the careful manner in which the business arrangements of the Association were conducted, and expressed an opinion that the continued existence of such associations as this must necessarily result in a much more efficient official inspection of dwelling-houses in all parts of the country. Speaking from personal experience of Edinburgh, in which only a similar association exists, Prof. Jenkin said during the recent run of an epidemic of typhoid there had only been one case in any of the houses under the charge of the Association, and in that case the fever was shown to have been contracted by the lady of the house while visiting the sick poor in the vilest districts of the city.

THE discovery of cesium and rubidium by Bunsen and Kirchhoff was, it is known, one of the first fruits of spectrum analysis. These are the most electro-positive of all known elements, and have a remarkable affinity for oxygen—so great in the case of cesium, that it has heretofore been found impossible to isolate the metal. The problem, however, has now been solved by Herr Setterberg (*Ann. der Chemie*, Bd. 211, p. 100), by electrolysis of a fused mixture of cyanide of cesium and cyanide of barium (large quantities of these costly substances having been placed at his disposal). Cesium is quite like the other alkali metals; it is silver white, and very soft and extensible. Its melting-point is about  $26^{\circ}5$  C.; and its specific gravity 1.88. In the air it ignites spontaneously, and when thrown on water behaves quite like sodium, potassium, and rubidium. Herr Setterberg has anew proved in his experiments that it is quite impossible to obtain cesium by the method adopted for rubidium and potassium, distilling the carbonate with charcoal at a white heat.

AMONG the institutions for which Jamaica is indebted to the energy and intelligence of the present Governor, Sir Anthony Musgrave, the Institute of Jamaica is probably destined to prove one of the most valuable as a means of diffusing information and organising local effort in the cause of industrial science. The Institute was constituted by a recent law which created a Board styled "The Board of Governors of the Institute of Jamaica," consisting of seven members appointed by the Governor; their duties being to establish and maintain an institution comprising a library, reading-room, and museum; to provide for the reading of papers, delivery of lectures, &c., and holding of examinations on subjects connected with literature, science, and art; to award premiums for the application of scientific and artistic methods to local industries; and to provide for the holding of exhibitions illustrative of the industries of Jamaica. The Institute occupies a building known as Date Tree Hall, in Kingston. On the lower floor there is a small museum containing a good geological collection made by the members of the late Geological Survey, a very complete conchological collection, and another of the birds of Jamaica. A beginning has also been made to form a collection of the fish of Jamaica, and about 150 duplicate specimens have been sent to the Smithsonian Institution to be named by Prof. Baird. On the upper floor is a library which contains a valuable collection of old local prints and records, as well as some 2000 volumes of standard European and American literary and scientific works. The Jamaica Institute in its present form is intended to occupy the position and take up the work of the late Royal Society of Arts and Agriculture, and it receives an annual vote from the Local Government. The present chairman of the Institute is the Hon. Ed. Newton, Lieut. Governor

and Colonial Secretary. Although under its new organisation it has only been in existence about three years, it appears to have already made a good start. Branch associations have been established at Spanish Town, Falmouth, and Sav-la-Mar. Prizes have been offered and awarded for several local industries, and an annual Flower and Horticultural Show has been started with the view of encouraging the cultivation of flowers, fruits, and vegetables. The Governors have recently published in a combined form six lectures delivered under their auspices last year in the Town Hall, Kingston, on local industries. They consist of "Objects of the Jamaica Institute," by the chairman, the Rev. John Radcliff; "Root-Food Growth in Jamaica," by the Rev. Josias Cork, Rector of St. Anne's; "Some Objects of Productive Industry," Part I. Coffee; Part II. Cinchona, by D. Morris, M.A., F.G.S., Director of Public Gardens and Plantations; "The Timbers of Jamaica," by W. Bancroft Espent, F.L.S.; "Stock and Stock-raising," by Archibald Roxburgh; and "The Mineral Springs of Jamaica," by Dr. J. Cecil Phillips. These lectures are of an essentially practical character, and their publication in a handy and compact form must tend to develop the numerous resources of the island.

WE have received a prospectus of the *Journal of the Royal Agricultural and Commercial Society of British Guiana*, edited by Mr. Everard F. im Thurn, M.A., Oxford, and Curator of the British Guiana Museum. This journal, which is to be published half-yearly, on the 30th of June and the 31st of December, is intended to contain not only or chiefly a record of the proceedings of the Society of which it is to be the organ, but also papers and occasional notes on agricultural, commercial, geographical, meteorological, chemical, botanical ornithological, entomological, anthropological, and literary subjects connected with British Guiana. A meteorological record will, as soon as it can be organised, form a regular feature in the journal. Lists of the known flora and fauna of the country will be given from time to time, as they can be prepared. A series of vocabularies of the Indian languages of Guiana is also in preparation. Folklore, collected from the Negroes and Indians, will occasionally be given, and many other kindred subjects will be treated. The importance of such a journal must be evident, and we hope Mr. im Thurn will receive adequate encouragement.

UNDER the title of "The Natural History of Leeds, Wharfedale, and Nidderdale," it is the intention of the Council of the Leeds Naturalists' Club and Scientific Association to publish during the forthcoming summer a summary of what is at present known of the animals inhabiting the districts marked out for special investigation by the Club. The Club has now been in existence for twelve years, during which time its members have—with more or less assiduity—collected and studied the local fauna, the result being the accumulation of a considerable mass of information, and the time has now arrived at which—if further progress is to be achieved—an epitome of what is already known should be published. The chief hindrance to progress now felt is the acknowledged want of an account of the work already accomplished, as a starting point for fresh investigations and new discoveries. Not only will the work comprise lists of the more important and well-investigated groups of animals, but it will include a notice of every group, however meagrely or imperfectly some of the more obscure ones may have been studied.

AT Angleur, close to Liège, an important archæological discovery has been made. At a depth of only 50 to 60 centimetres about twenty antique bronzes, some of remarkably fine workmanship, have been found. Amongst them are two female statuettes, one statuette of a youth, two female heads, three bearded Mercury heads, two tiger's heads, a lion with raised claw, &c. All



the objects are covered with fine green Patina, and are evidently the parts of an ancient fountain, which adorned the hall or garden of the villa of a wealthy Roman. The discovery is all the more interesting, as the existence of Roman antiquities in the neighbourhood of Liège has never been suspected before.

THE sudden and highly unpleasant occurrence of large quantities of sulphuretted hydrogen at Aetolikon (near Missolonghi), to which we referred a short time ago, was repeated on January 6 last. At the same time a slight earthquake was observed, and quantities of pumice-stone were observed floating upon the sea surface. Orders were given by the authorities to investigate the phenomenon scientifically with a view to ascertaining whether a rise of temperature has taken place in the sea-water or soil of the shore. The depth of the sea is also to be measured, to see whether any variations have taken place.

THE Göttingen Royal Society of Sciences offers, in the physical class, a prize of 50 ducats (say 23*l.*) for the best investigation, with accurate experiments, of the chlorides and amides of cyanogen (the present data regarding these compounds being rather uncertain). Papers must be sent in before the end of September, 1884. The same month this year closes the time for treatment of the prize question in the mathematical class, viz. the nature of the unpolarised ray of light.

THE seeds of some valuable new species or varieties of *Cinchona* that have not, it seems, as yet been introduced to the Indian plantations have recently been consigned to Messrs. Christy and Co., of Fenchurch Street. These new forms are very rich in quinine, and are thus referred to in Markham's "Travels in India and Peru":—"I have been assured by Gironda and Martinez that there are three sorts of Calisaya: the 'Calisaya fina' (*Cinchona Calisaya v. vera*, Wedd.), the 'Calisaya morada' (*C. boliviana*, Wedd.), and the 'Calisaya verde' [*Cinchona Calisaya oblongifolia*]. They also told me that the last-named tree was a very large one, with leaves wholly devoid of any red colour on the nerves, and habitually growing very far down the valleys and even in the plains. A tree of this variety supplies 600 or 700 lbs. weight of bark, whereas the *Calisaya fina* yields only 300 to 400 lbs. Gironda declares that in the province of Muneças, Bolivia, he saw one that furnished 1000 lbs. of taba, that is to say, of the bark, of the trunk, and lower branches." It is said that better results are to be obtained by cultivating the *Calisaya verde* than the *Calisaya fina*, because although the former yields only 6½ to 9 per cent. of pure sulphate of quinine, yet as it yields twice the amount of bark as the *fina* or *Ledgeriana*, the produce of the *Calisaya verde* is equivalent to from 13 to 18 per cent. of quinine. "Moreover, from the fact that the *Calisaya verde* is a more vigorous tree than the delicate *Ledgeriana*, and will grow at a lower elevation, it is obvious that it can be cultivated to a much greater extent, and may be extremely valuable for grafting the *Ledgeriana* upon, more especially since the attempt to graft the *Ledgeriana* upon *C. succirubra* has proved unsuccessful."

A COMMISSION has been appointed in Paris composed of MM. Wurtz, Berthelot, and other influential men of science connected with politics, to establish a superior School of Chemistry and Physics. The course of instruction will occupy three years. It is stated that M. Cocheret will devote to this institution the surplus of the International Exhibition of Electricity.

THE number of municipal services in Paris in which telegraphs or telephones are used is so large that the civic authorities have decided to establish a telegraphic examination for their employees.

AN interesting series of papers on the volcanoes of Japan has been commenced by Prof. Milne in the *Japan Gazette* of Yokohama. The articles are compiled almost wholly from native records, and while mentioning the particulars of the various eruptions within the historical period, will also refer to the legends

and superstitions of the people respecting these phenomena. Prof. Milne mentions as a noticeable fact the association of many of the eruptions with some great calamity or other remarkable event. The mental effects produced by seismic phenomena have frequently been very curious. Thus an emperor orders the people to pray for forgiveness of their sins on account of an eruption; a governor presents a shrine to the deity of the mountain to prevent any further outbreaks; and priests are ordered to pray to a mountain to cease ruining the crops by pouring forth ashes. The writer also thinks that if the history of earthquakes and volcanoes were closely examined in other countries as well as Japan, these phenomena would be found to play an important part in engendering superstition and producing mental aberrations, traces of which may be met with in the forms of worship. The first of these papers, which is on Mount Aso in Kiushiu, one of the most remarkable volcanoes in the world, appeared on December 31. The series promises to be one of the highest scientific interest.

ON February 12 the new Natural History Museum was opened at Berne.

EARTHQUAKES are reported from Chieti and Castelfrentano, in the Abruzzi, where shocks were observed on February 12 at 3 a.m.

ON February 3 a remarkable fall of meteorites occurred in Transylvania. At Klausenburg an intense light suddenly flashed into view at 3.45 p.m. on that day, the sky being perfectly cloudless. The meteor was seen in the north-east part of the sky, and when it disappeared a white cloud was seen in its stead, which spread into a thin streak stretching from west to east. Soon afterwards a loud report was heard. The next day the news arrived that near Mocs, about twenty-five miles to the east of Klausenburg, some meteorites had fallen; one of these weighs 35 kilogrammes, and penetrated 68 centimetres deep into the ground. Two other pieces were found near Olah Gyeres, and five others near Vajda Kamaras. Prof. Koch collected no less than sixty pieces of smaller dimensions near Gyulatelke, Visa, and Bare to the north of Mocs. The direction of the meteor was from north-west to south-east, to judge from the position of the fragments; the latter were scattered over a line of about fifteen miles in length.

DR. SCHLIEMANN will continue his Trojan excavations this month as soon as the weather permits. The firman he has obtained permits him to extend his researches to the whole Troas. He will therefore not confine himself solely to Hissarlik, but will also closely investigate the environs of Balli-Dagh, where ancient Troy was situated, according to Le Chevalier's theory.

AT the instance of the Conseil d'Hygiène for the Department of the Seine, M. Delpech has drawn up an instructive report (*La Nature*) on the dangers arising from bees. The loss and inconvenience incurred by some sugar refineries in Paris through bee-keepers' establishments in the neighbourhood, attracted notice some time ago; at the Lay refinery the depredation is estimated at 25,000 francs a year, and the workmen, nearly naked, are often stung. The children (1200) at a school in the rue de Tanger, have suffered similarly to a large extent. M. Delpech gives information with regard to the bee's sting, notices three classes of injuries caused by it, and cites a number of cases in which it has proved fatal. Stings on the face are the most serious, the nerve-centres being so near. Bees are evidently not to be trifled with. On the triple score of material damage, great inconvenience, and very real danger, M. Delpech condemns bee-keeping in large centres of population.

AN interesting paper by Mr. F. J. Faraday on "Prehistoric Fishing," is published in "Anglers' Evenings" (Manchester). The

author has brought together much curious and useful information on the piscatory, as well as other habits, of our prehistoric ancestors, and with considerable ingenuity applies the method of evolution in tracing the progress and development of "the gentle art."

AT Steeten on the Lahn (near Runkel) interesting discoveries have recently been made in a cave. They consist of seven human prehistoric skeletons and animal remains. The latter must have belonged to the Tertiary period. They were found in such enormous quantities that several generations must be represented. The spot positively teems with remains of the Cave period, so that it is highly desirable that the State should order that more extensive scientific excavations be speedily made.

THE writer of the article on Lieut. Collet's work on the Compass in last week's NATURE, asks us to make the following correction: p. 383, col. 1, line 8 from bottom, delete "only," and in line 7, instead of "whereas it is three times as much in" read "which is about twice as much as in."

THE additions to the Zoological Society's Gardens during the past week include an African Brush-tailed Porcupine (*Atherura africana*) from West Africa, presented by Mr. J. Cheetham; a Black-necked Heron (*Ardea atricollis*) from Cape Colony, presented by the Rev. G. H. R. Fisk, C.M.Z.S.; two Blossom-headed Parrakeets (*Palaornis cyanocephalus*) from India, presented by Mrs. Francis Fox; a Waxwing (*Ampelis garrulus*), European, presented by Mr. W. H. St. Quintin; a Carrion Crow (*Corvus corone*), British, presented by Mr. F. H. Worsley Benison; a Rhesus Monkey (*Macacus erythraeus*) from India, a Bonelli's Eagle (*Nisaetus fasciatus*), European, deposited; two Common Buntings (*Emberiza miliaria*), two Black-headed Gulls (*Larus ridibundus*), a Common Curlew (*Numenius arquata*), a Bar-tailed Godwit (*Limosa lapponica*), two Knots (*Tringa canutus*), British, purchased.

### OUR ASTRONOMICAL COLUMN

THE EARLIEST DAY-LIGHT OBSERVATIONS OF STARS.—In No. 2616 of the *Astronomische Nachrichten* Prof. Winnecke has an interesting note on the question, Who first observed stars in full daylight? The credit of the observation has been generally accorded to J. B. Morin in 1635. Arago, for instance, says: "Il est évident que c'est à Morin qu'il faut remonter pour trouver la première observation authentique d'une étoile vue en plein jour;" Zach and many other astronomical writers have held the same opinion. Morin's observations are found in his work, "Longitudinum Terrestrialium necnon Coelestium nova et hactenus optata Scientia," first published, as it appears, in an extended form at Paris in 1638. At the end of March, 1635, he saw Arcturus half an hour after sunrise. This observation of Morin's appears to have been overlooked in France, since in May, 1669, we find Picard expressing his surprise that he had been able to observe the meridian altitude of Regulus thirteen minutes before sunset; his observation is printed in Lemonnier's "Histoire Céleste": "Le 3 mai (1669), hauteur méridienne de Regulus 54° 42' 50", cette hauteur méridienne fut prise en plein jour à 7h. 5m. du soir, environ 13m. avant le coucher du Soleil, ce qui ne s'étoit encore jamais fait." On July 23 following he observed the meridian altitude of Arcturus, while the sun was 17° above the horizon, and speaks of the observation as a remarkable one, concluding: "il est maintenant facile de trouver immédiatement les Ascensions droites des Etoiles fixes non seulement par les horloges à pendule, mais aussi par l'observation du vertical du Soleil au même temps qu'on observera la hauteur méridienne d'une étoile fixe."

Prof. Winnecke points out that Morin was preceded in his discovery that the stars may be observed in daylight by more than one person. In a letter written from Amsterdam to Gassendi, by Martinus Hortensius, and dated October 12, 1636, he mentions that observations such as Morin had claimed to be the first to make, were by no means new to him, and from the dates of the publications in which he records his own observations it is

clear that his claim of priority to Morin is justified, though when his earliest observation was made cannot, as Prof. Winnecke remarks, be certainly inferred. Schickard, Professor of Hebrew and Mathematics at Tübingen, whose first work, the "Astroscopium," appeared in 1623, and was frequently reprinted, saw Arcturus in broad daylight as early as 1632. In the "Historia Coelestis, ex observationibus Tychonis Brahe," by Albertus Curtius, at p. 956 we read: "1632 Martii 2. Nota. Cor Scorpii clario die adhuc à me visum per conspicienda tamen cum Saturnus aëre cognosceretur: nec aër fuit omnino purus."

Prof. Winnecke concludes that Schickard, as well as Hortensius, had observed fixed stars in daylight previous to Morin, who, as we have said, has been generally credited with this advance in astronomical observation.

BINARY STARS.—Mr. J. L. Casey, U.S.A., has calculated first approximations to the orbits of  $\phi$  Ursæ Majoris and  $\Sigma$  1757 (Piazzi xiii. 127). The former is one of O. Struve's discoveries, his first and last published epochs being—

1842.34, Pos. 4°.4, Dist. 0".46.  
1875.48, ,, 295".5, certainly oblong.

The apparent motion being direct, or with increasing angles, these indicate a change of 290° in thirty-three years.

$\Sigma$  1757 was measured by Struve in 1825. For comparison with his first epoch, we add Prof. Asaph Hall's for 1879—

Struve, 1825.37, Pos. 10°.0, Dist. 1".60  
A. Hall, 1879.40, ,, 68".9, ,, 2".34

The elements are as follow:—

	$\phi$ Ursæ Majoris.	$\Sigma$ 1757.
Periastron passage ... ..	1877.12	1797.42
Node ... ..	105° 18'	344° 43'
Node to periastron ... ..	72° 7'	315° 28'
Inclination ... ..	57° 5 7'	29° 32'
Excentricity ... ..	0.788	0.5079
Semi-axis major ... ..	0".54	2".29
Period ... ..	115.4 years.	401.0 years.

### GEOGRAPHICAL NOTES

AT the meeting of the Geographical Society on Monday last, Major J. E. Sandeman, B.S.C., read a paper on recent explorations of the sources of the Irawaddy. He referred first to Mr. R. Gordon's able report on the hydrology and hydrography of the river, in which the old theory of the Saupo, or great river of Tibet, being the main source of its vast stream, is revived, and then to what has lately been done, showing that the Saupo more probably unites with the Kihong. Major Sandeman next dealt with some endeavours to reach the source of the Irawaddy, more especially that made by a Burman named Alaga, who had been trained by himself. This man started from Bhamo in October 1879, and was absent six months. He brought back a good deal of information respecting the western and eastern branches of the Irawaddy, but we cannot see how he can be said to have explored their sources. It was somewhat unsatisfactory to learn that "political considerations"—the old Indian bugbear—prevented Major Sandeman from stating why the explorer was compelled to turn back before doing what he was sent to do. Though the geographical results of Alaga's journey are not what might have been expected, he has brought back some very interesting information regarding the domestic habits, religious customs, &c., more particularly of the Kachins, or Kakhyens. In concluding his paper Major Sandeman summed up the various attempts which have been made to reach the sources of the Irawaddy, and to discover the true outlet of the Saupo.

COL. VENIUKOF has informed the French Geographical Society that M. Lessar, a Russian engineer officer, has completed the levelling of the country between Askabad and Sarakhs. This operation has proved the practicability of constructing a railway between these two places, and even for some forty miles beyond Sarakhs, in the valley of the Heri-rud (Tejend). It is estimated that the cost would not exceed 320,000*l*. At the same time M. Gladysheff, the astronomer of the expedition, has determined the geographical position of thirteen points between Askabad, Sarakhs, and Meshed. At Meshed he is said to have purchased the plan of the town which Mr. E. O'Donovan had made, but apparently lost. Perhaps Mr. O'Donovan may enlighten us on this point, when he gives his account of his varied